CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NUMBER 89-027

SITE CLEANUP REQUIREMENTS FOR:

Siliconix, Inc.
2201 Laurelwood Road
Santa Clara, CA 95054
Santa Clara County

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter called the Board) finds that:

1. Siliconix, Inc. owns and operates a semiconductor wafer manufacturing facility located at 2201 Laurelwood Road, Santa Clara, Santa Clara County. Siliconix, Inc. is hereinafter referred to as the discharger.

2. The Siliconix facility is located on about twelve (12) acres of land near the intersection of the Montague Expressway and Bayshore Freeway (Route 101). This is an area of flat to gentle relief in the southern San Francisco Bay region, within the Santa Clara Valley groundwater basin.

3. Investigation at the Siliconix facility began in 1987 as a result of clean-up activities for a fuel tank leak at an adjacent, downgradient site which found evidence of solvent pollution in the groundwater. The possibility that this pollution might be originating offsite, upgradient, led to the initial investigations at the Siliconix facility.

4. The initial Siliconix investigation began in September 1987 and included review of existing data on soil or groundwater pollution, and chemical use and storage data. During this review it was discovered that soils polluted with trans-1,2-dichloroethylene (trans-1,2-DCE) had been detected at Siliconix in 1984. Two of these soil samples were contaminated with 2,500 and 6,700 μg/kg respectively of trans-1,2-DCE. Additional investigation of soil pollution has been limited.

5. A preliminary groundwater investigation was carried out at Siliconix in January and February 1988. This investigation included the installation and sampling of three new monitoring wells and the sampling of one existing well. Analyses of groundwater samples indicated high levels of 1,2-DCE and trichloroethylene (TCE) in the most downgradient, onsite wells, MW-1 and MW-2. The upgradient well, MW-3 also onsite, shows no evidence of groundwater

pollution. Well MW-1 had the highest levels of groundwater pollution with 8300 µg/l of 1,2-DCE and 1,700 µg/l of TCE. Analyses of groundwater samples from well MW-2 indicated 2400 µg/l of 1,2-DCE and 830 µg/l of TCE.

6. A soil gas survey and confirmatory sampling of well MW-2 was conducted in May 1988. This study focused on the offsite, downgradient area and obtained groundwater samples through soil-gas probes. This data indicates that a pollution plume of TCE and 1,2-DCE extends downgradient from the Siliconix facility, offsite, for approximately 400 feet. No monitoring wells have been installed offsite, therefore the extent and levels of pollution in this offsite area will require confirmation.

7. The full extent of soil pollution is unknown. Chemical use data indicates that small quantities of solvents were used by Siliconix at this location and that all storage was above ground. The estimated lateral extent of the groundwater plume is based on soil gas survey data.

8. Onsite and offsite interim containment and cleanup measures need to be implemented to alleviate the threat to the environment posed by the migration of the groundwater plume of organic solvents and to provide a substantive technical basis for designing and evaluating the effectiveness of final cleanup alternatives.

9. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) on December 17, 1986. The Basin Plan contains water quality objectives and beneficial uses for South San Francisco Bay and contiguous surface and groundwaters.

10. The existing and potential beneficial uses of the groundwater underlying and adjacent to the facility include:

    a. Industrial process water supply
    b. Industrial service water supply
    c. Municipal and Domestic water supply
    d. Agricultural water supply

11. The existing and potential beneficial uses of the surface water adjacent to and contiguous with San Thomas Aquinas Creek, Gaudelupe Slough and South San Francisco Bay include:

    a. Contact and non-contact water recreation
    b. Wildlife habitat
    c. Preservation of rare and endangered species
    d. Estuarine habitat
    e. Fish spawning and migration
    f. Industrial service supply

g. Shellfishing
h. Navigation
i. Ocean commercial and sport fishing

12. The discharger has permitted, and threatens to cause or permit waste to be discharged or deposited where it is or probably will be discharged to waters of the State and creates or threatens to create a condition of pollution or nuisance.

13. This action is an order to enforce the laws and regulations administered by the Regional Board. This action is categorically exempt from the provisions of the CEQA pursuant to Section 15321 of the Resources Agency Guidelines.

14. The Board has notified the dischargers and interested agencies and persons of its intent under California Water Code Section 13304 to prescribe Site Cleanup Requirements for the discharge and has provided them with the opportunity for a public hearing and an opportunity to submit their written views and recommendations.

15. The Board, in a public meeting on February 15, 1989, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that the discharger shall cleanup and abate the effects described in the above findings as follows:

A. PROHIBITIONS

1. The discharge of wastes or hazardous materials in a manner which will degrade water quality or adversely affect the beneficial uses of the waters of the State is prohibited.

2. Further significant migration of pollutants through subsurface transport to waters of the State is prohibited.

3. Activities associated with the subsurface investigation and cleanup which will cause significant adverse migration of pollutants are prohibited.

B. SPECIFICATIONS

1. The storage, handling, treatment or disposal of soil or groundwater containing pollutants shall not create a nuisance as defined in Section 13050(m) of the California Water Code.

2. The discharger shall conduct monitoring activities as needed to define the current local hydrogeologic conditions, and the lateral and vertical extent of soil and groundwater pollution. Should monitoring results show evidence of plume migration, additional characterization of pollutant extent may be required.

3. The discharger shall identify and properly seal or abandon all wells within the legal site boundary, or offsite within or adjacent to the pollution plume, which may have been, or threaten to be, conduits for the spread of groundwater pollution.

C. PROVISIONS

1. The discharger shall comply with all Prohibitions and Specifications of this Order, in accordance with the following task and time schedule:

TASK 1. PROPOSAL FOR SOIL AND GROUNDWATER POLLUTION CHARACTERIZATION:

Submit a technical report containing a proposal to identify all onsite pollution sources and to define the horizontal and vertical extent of soil and groundwater pollution. The report shall also contain a Site Safety Plan and Site Sampling plan. These plans shall be consistent with CERCLA/SARA regulations and guidance documentation.

COMPLETION DATE: May 1, 1989

TASK 2. COMPLETION OF SITE CHARACTERIZATION AND EVALUATION OF INTERIM REMEDIAL ALTERNATIVES:

Submit a technical report documenting completion of the necessary tasks identified in the technical report submitted for Provision 1, Task 1. This report shall also contain an evaluation of proposed interim remedial alternatives and with each interim remediation alternative an implementation plan and time schedule. The time schedule shall specify a date for submission of a technical report documenting the implementation of the selected interim remedial actions. Proposed interim remedial alternatives shall evaluate the removal and/or cleanup of polluted soils and evaluate alternative hydraulic control systems to contain and to initiate cleanup of polluted groundwater. If extraction of groundwater is an element of a proposed interim action this report

shall also evaluate the re-injection or re-use of the extracted groundwater. If re-injection or re-use of the groundwater is demonstrated to be impracticable then the report should include a completed NPDES application to discharge to surface waters, if such discharge is an element of the plan.

COMPLETION DATE: February 1, 1990

TASK 3: EVALUATION OF INTERIM REMEDIAL ACTIONS:

Submit a technical report which evaluates the effectiveness of the interim hydraulic containment system. Such an evaluation shall include, but need not be limited to, an estimation of the groundwater flow rate and gradient, capture zone of the extraction wells, establishment of the cones of depression by field measurements, and presentation of chemical monitoring data, if extraction wells are proposed. This report shall also evaluate and document the removal and/or cleanup of polluted soils, if such removal and/or cleanup is an element of the remedial measures. Specific modifications to the system and an implementation time schedule shall be proposed in the event that the soil remediation or hydraulic control system is demonstrated to be ineffective in containing and removing the onsite pollutants.

COMPLETION DATE: August 15, 1990

TASK 4: FEASIBILITY STUDY OF FINAL REMEDIAL ALTERNATIVES:

Submit a technical report containing a summary of results of site investigations; an evaluation of the interim remedial actions in place; a feasibility study evaluating alternative final remedial measures; proposed final cleanup objectives; and the tasks and time schedule necessary to implement the recommended final remedial alternatives. Based on this report the Board will select appropriate final clean-up goals and remedial actions.

COMPLETION DATE: March 1, 1991

3. All technical reports submitted must be acceptable to the Executive Officer. The submittal of technical reports evaluating interim and final remedial measures

shall include a projection of the cost, effectiveness, benefits, and impact on public health and environment.

4. The site characterization and feasibility study shall consider the guidance provided by Subpart F of the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300); Section 25356.1 (c) of the California Health and Safety Code; CERCLA guidance documents with reference to Remedial Investigation, Feasibility Studies, and Removal Actions; and the State Water Resources Control Board's Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California".

5. If the discharger is delayed, interrupted or prevented from meeting one or more of the completion dates specified in this Order, the discharger shall notify the Executive Officer prior to the deadline for the completion date.

6. Technical reports on compliance with the Prohibitions, Specifications, and Provisions of this Order shall be submitted on a quarterly basis, commencing with the report for the second quarter 1989 due July 15, 1989. The quarterly reports shall include;

   a. a summary of work completed since the previous quarterly report,
   b. appropriately scaled and labeled maps showing the location of all monitoring wells, extraction wells, and existing structures,
   c. updated water table and piezometric surface maps for all affected water bearing zones,
   d. a cumulative tabulation of all well construction data, groundwater levels and chemical analysis results for all site monitor wells
   e. a cumulative tabulation of volume of extracted groundwater and chemical analysis for all site groundwater extraction wells
   f. identification of potential problems which will cause or threaten to cause noncompliance with this Order and what actions are being taken or planned to prevent these obstacles from resulting in noncompliance with this Order,
   g. in the event of noncompliance with the Provisions and specifications of this Order, the report shall include written justification for noncompliance and proposed actions to achieve compliance.

7. All hydrogeological plans, specifications, reports, and documents shall be signed by or stamped with the seal of a registered geologist, engineering geologist or

professional engineer.

8. All samples shall be analyzed by State certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain Quality assurance/quality control records for Board review.

9. The discharger shall maintain in good working order, and operate, as efficiently as possible, any facility or control system installed to achieve compliance with the requirements of this Order.

10. Copies of all correspondence, reports, and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order, shall be provided to the following agencies:

    a. Santa Clara Valley Water District
    b. Santa Clara County Health Department
    c. City of Santa Clara
    d. State Department of Health Services/TSCD

    The Executive Officer may additionally require copies of correspondence, reports and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order to be provided to the U.S. Environmental Protection Agency, Region IX, and to a local repository for public use.

11. The discharger shall permit the Board or its authorized representative, in accordance with Section 13267(c) of the California Water Code:

    a. Entry upon premises in which any pollution sources exist, or may potentially exist, or in which any required records are kept, which are relevant to this Order.

    b. Access to copy any records required to be kept under the terms and conditions of this Order.

    c. Inspection of any monitoring equipment or methodology implemented in response to this Order.

    d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the discharger.

12. The discharger shall file a report on any changes in site occupancy and ownership associated with the

facility described in this Order.

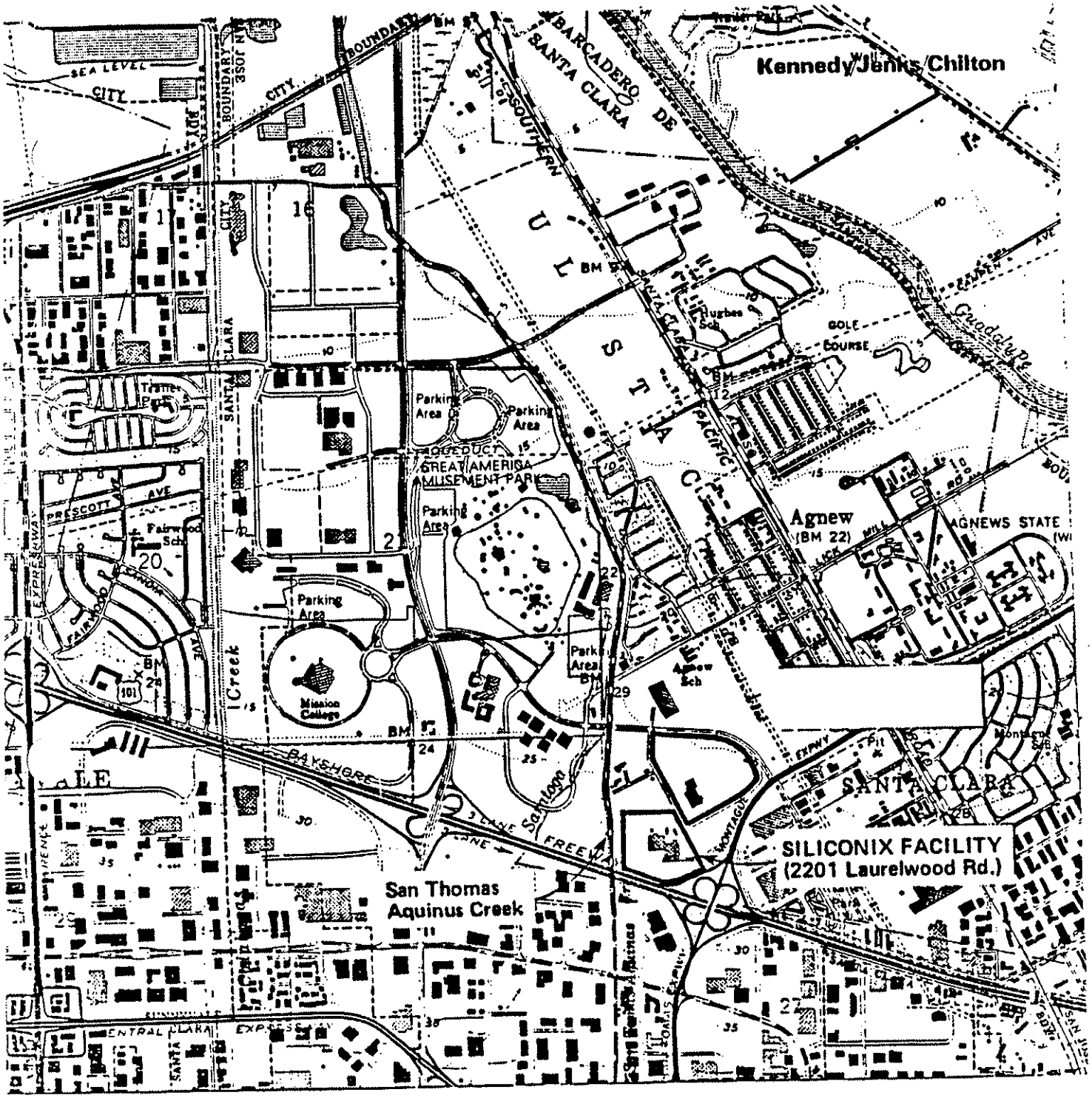
13. If any hazardous substance is discharged in or on any waters of the state, or discharged and deposited where it is, or probably will be discharged in or on any waters of the state, the discharger shall report such discharge to this Regional Board, at (415) 464-1255 on weekdays during office hours from 8 a.m. to 5 p.m., and to the Office of Emergency Services at (800) 852-7550 during non-business hours. A written report shall be filed with the Regional Board within five (5) working days and shall contain information relative to: the nature of waste or pollutant, quantity involved, duration of incident, cause of spill, Spill Prevention, Control, and Countermeasure Plan (SPCC) in effect, if any, estimated size of affected area, nature of effect, corrective measures that have been taken or planned, and a schedule of these activities, and persons/-agencies notified.

14. The Board will review this Order periodically and may revise the requirements when necessary.

I, Steven R. Ritchie Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on February 15, 1989.

Steven R. Ritchie
Executive Officer

Attachments: Site location map
Map of TCE plume and neighboring facilities



Kennedy/Jenks/Chilton

Siliconix, Inc.
Santa Clara, California
Summary Report

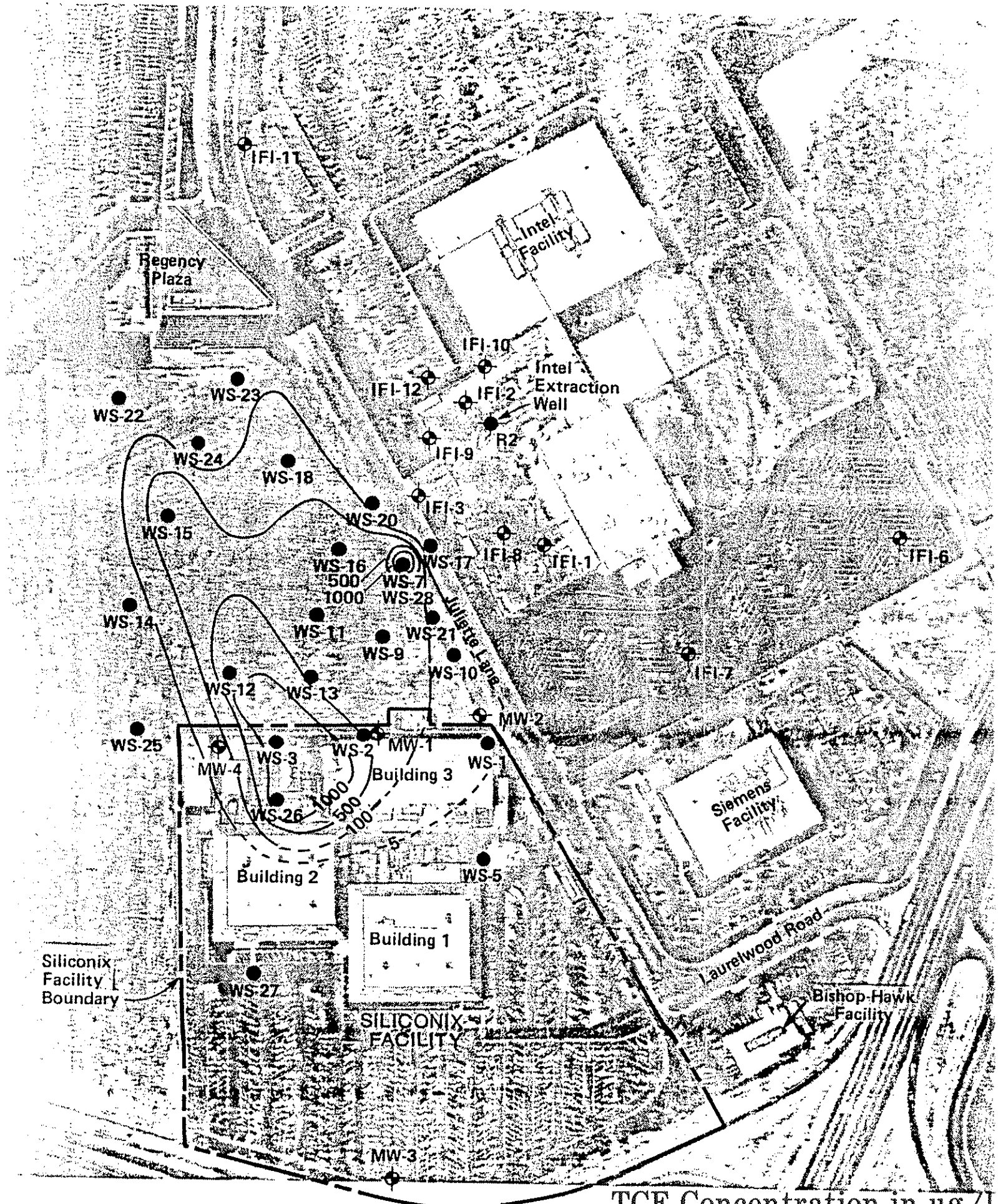
Site Location Map

K/J/C 880001
January 1988

Figure 1

Note:

Base map from U.S.G.S. Quadrangle 7.5 minute series: Milpitas, California, 1961, photorevised 1980.


IFI-11
Intel Facility
Regency Plaza
IFI-10
IFI-12
IFI-2
Intel Extraction Well
R2
IFI-9
WS-23
WS-22
WS-24
WS-18
IFI-3
WS-20
WS-15
WS-16
500
1000
WS-7
WS-28
WS-17
IFI-8
IFI-1
IFI-6
WS-14
WS-11
WS-9
WS-21
WS-10
Laurelwood Road
IFI-7
WS-12
WS-13
MW-2
WS-25
MW-4
WS-3
WS-2
MW-1
WS-1
Building 3
Siemens Facility
WS-26
1000
500
100
5
Building 2
WS-5
Building 1
Siliconix Facility Boundary
WS-27
Bishop-Hawk Facility
SILICONIX FACILITY
MW-3
TCE Concentration in ug/l